Remarks

Prior to this Amendment, claims 1-63 are pending in the application. Claims 1-63 stand rejected according to the Office action dated December 15, 2003. By this Amendment, Applicants are amending claims 1, 7-9, 11-15, 20, 21, 23, 30, 31, 33, 37, 38, 41, 42, 47, 49, 50, 52-58. Entrance of these amendments and reexamination and reconsideration of claims 1-63 in view of the amendments and remarks contained herein are respectfully requested.

Claims 1-63 are rejected under 35 U.S.C. § 102 (e) as being anticipated by United States Patent No. 5,361,776 ("Samuelson").

Amended claim 1 of the present application specifies a method of displaying physiological patient data from a cyclic physiological waveform including, among other things:

- assigning a first color to each data point having an amplitude in a first range;
- assigning a second color to each data point having an amplitude in a second range;
- assigning a third color to each data point having an amplitude in a third range, the first color, the second color, and the third color all being different colors; and
- displaying the data points in a colorized three dimensional representation.

Amended claim 15 of the present application specifies a method of displaying physiological patient data from a cyclic physiological waveform including, among other things:

- displaying the physiological patient data in a colorized three dimensional representation,
- assigning a first color to each data point having an amplitude in a first range,
- assigning a second color to each data point having an amplitude in a second range, and
- assigning a third color to each data point having an amplitude in a third range, the first color, the second color, and the third color all being different colors.

Amended claim 23 of the present application specifies an apparatus for displaying physiological patient data from a cyclic physiological waveform including, among other things:

- a processor for producing a colorized three dimensional representation of physiological patient data from a cyclic physiological waveform, the physiological patient data including a plurality of data points, each data point having an amplitude representing a value of a physiological parameter and being assigned a first color when the amplitude is in a first range, a second color when the amplitude is in a second range, and a third color when the amplitude is in a third range, the first color, the second color, and the third color all being different colors.

Amended claim 41 of the present application specifies a software program for generating a display of physiological patient data from a cyclic physiological waveform including, among other things:

- a program module for displaying a colorized three dimensional representation of the physiological patient data; and
- a program module for determining a pixel color based on the Y coordinate of a data point, the pixel color being a first color when the Y coordinate is in a first range, a second color when the Y coordinate is in a second range, and a third color when the Y coordinate is in a third range, the first color, the second color, and the third color all being different colors

Amended claim 42 of the present application specifies an apparatus for displaying physiological patient data from a cyclic physiological waveform including, among other things:

- a means for producing a colorized three dimensional representation of physiological patient data from a cyclic physiological waveform, the physiological patient data including a plurality of data points, each data point having an amplitude representing a value of a physiological parameter and being assigned a first color when the amplitude is in a first range, a second color when the amplitude is in a second range, and a third color when the amplitude is in a third range, the first color, the second color, and the third color all being different colors.

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As discussed with Examiner Tram and Supervisor Bella in the telephone interview on February 14, 2004, Samuelson does not disclose, among other things, the display of physiological patient data from the cyclic physiological waveform in a colorized three dimensional representation where data points of the three dimensional representation are displayed in more than one color. Instead, Samuelson discloses the display of time domain reflectometry data in a single color, and more specifically, black. Samuelson includes no discussion regarding the colorization of data points as is recited in each of independent claims 1, 15, 23, 41, and 42.

As discussed on page 7 of the present application, "The use of color to enhance the display allows easy detection by the clinician of significant aspects of the data." With reference to FIG. 10 of Samuelson, it is evident that use of a single color does make review of the three dimensional representation difficult. For example, it is difficult to visualize the variation of the waveforms (e.g., 101-104) with respect to each other, especially without the use of indicator lines (e.g., respiration time slice 105 and cardiac time slice 110). With reference to FIGS. 3-7 of the present application, colorization of the data points plotted to form a three dimensional representation of the invention allows for easy detection of such variations.

Accordingly, Samuelson fails to teach, describe, or suggest the subject matter related to a colorized three dimensional representation of physiological patient data from a cyclic physiological waveform as specified in claims 1, 15, 23, 41 and 42. The Applicants respectfully submit that claims 1, 15, 23, 41 and 42 are novel and patentable over Samuelson.

Claims 2-14 and 60-61; claims 16-22; claims 24-40 and 62; and claims 43-59 and 63 ultimately depend upon claims 1, 15, 23, and 42, respectively, and are therefore allowable for the reasons set forth above with respect to claims 1, 15, 23, and 42. Therefore, claims 2-14 and 60-61; claims 16-22; claims 24-40 and 62; and claims 43-59 and 63 are allowable. Additionally, claims 2-14 and 60-61; claims 16-22; claims 24-40 and 62; and claims 43-59 and 63 specify additional limitations that, in combination with claims 1, 15, 23, and 42, respectively, are believed to be inventive. Claims 2-14 and 60-61; claims 16-22; claims 24-40 and 62; and claims 43-59 and 63 are therefore allowable. Examples of these additional inventive limitations include:
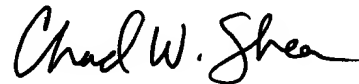
- displaying electrocardiogram data in a colorized three dimensional representation (claims 2 and 16)
  - Although a cardiac time slice can be derived from the time domain reflectometry data of Samuelson, the cardiac time slice is not electrocardiogram data as is generally understood by those skilled in the art.

- displaying blood pressure data in a colorized three dimensional representation (claims 3 and 17)
  - Samuelson includes no discussion regarding blood pressure data.

- displaying cardiac output data in a colorized three dimensional representation (claims 4 and 18)
  - Samuelson includes no discussion regarding cardiac output data.

- displaying pulse oximetry data in a colorized three dimensional representation (claims 5 and 19)
  - Samuelson includes no discussion regarding pulse oximetry data.

- storing the physiological data in a memory array (claims 6, 29, and 48) such as a waveform array (claims 7, 20, 30, and 49)
  - The only reference to memory in Samuelson is an internal memory of an oscilloscope (see col. 11, lines 65-67 of Samuelson).
  - A memory array, and more specifically, a waveform array, are specific types of memory.

- parsing the physiological data into a series of waveforms (claims 8, 37, and 56) such as median waveforms (claims 9, 12, 21, 38, and 57)
  - Samuelson includes no discussion regarding the aggregation of the physiological data (e.g., to reduce clutter on the display as discussed in the Background of the Invention section of the present application).
  - A median waveform is one example of such an aggregated waveform that is representative of a plurality of waveforms.

- assigning colors within a relevant range such as +0.5 mV to -0.5 mV (claims 14 and 22)
  - As discussed above, Samuelson includes no discussion with regard to colorization.

In view of the above amendments and remarks it is submitted that the claims are patentably distinct over the cited art of record, that all rejections to the claims have been overcome, and that the application is in condition for allowance. Entry of this Amendment is therefore respectfully requested.

If any issues remain outstanding following entry of the above amendments, the Examiner is invited to contact the undersigned Applicants' Representative at (262) 956-6525 to discuss the claims further.

Respectfully submitted,

Chad W. Shea

Chad W. Shea
Reg. No. 48,470

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Michael Best & Friedrich LLP
100 East Wisconsin Avenue
Milwaukee, Wisconsin 53202-4108
(262) 956-6560